WHAT IS CLAIMED IS:

1. A method for a given node to join an ad hoc network of a plurality of energy-conserving nodes, the method comprising:

transmitting a wake-up signal;

receiving a message from one of the energy-conserving nodes in the network, the message including information sufficient for the given node to determine how to join the network; and

joining the network using the information.

2. The method of claim 1, wherein the transmitting comprises:

powering on a bellringer transmitter,

transmitting a wake-up signal, and

powering off the bellringer transmitter.

3. The method of claim 1, wherein the receiving comprises:

powering on a main transceiver;

waiting to receive the message from the one of the energy-conserving nodes, and

receiving the message from the one of the energy-conserving nodes, the message including information regarding a time when at least one node of the energy-conserving nodes is available to receive messages.

4. The method of claim 1, further comprising:

retransmitting the wake-up signal when a message is not received during a predefined time period.

5. The method of claim 4, further comprising:

setting the time period to a variable value.

6. The method of claim 4, further comprising:

setting the time period to a fixed value.

7. The method of claim 5, further comprising:

setting the time period to a relatively small value, and

increasing a value of the time period as a number of failed network joining attempts increases.

8. The method of claim 1, further comprising:

receiving, by the one of the energy-conserving nodes, the wake-up signal; and

transmitting the message, by the one of the energy-conserving nodes, responsive to receiving the wake-up signal.

9. The method of claim 8, further comprising:

waiting a random time interval, by the one of the energy-conserving nodes, before transmitting the message.

10. The method of claim 8, further comprising:

waiting a deterministic time interval, by the one of the energy-conserving nodes, before transmitting the message.

11. The method of claim 8, further comprising:

determining, after the one of the energy-conserving nodes receives the wake-up signal, whether the one of the energy-conserving nodes is to respond to the wake-up signal, wherein

the one of the energy-conserving nodes performs the transmitting of the message only when the one of the energy-conserving nodes determines that the one of the energy-conserving nodes is to respond to the wake-up signal.

12. The method of claim 11, wherein the determining whether the one of the energy-conserving nodes is to respond is a random decision.

13. The method of claim 11, wherein the determining whether the one of the energy-conserving nodes is to respond is based on a received signal strength of the wake-up signal.

14. The method of claim 11, wherein the determining whether the one of the energy-conserving nodes is to respond is based on an understanding of a current network density from a point of view of the one of the energy-conserving nodes.

15. The method of claim 11, wherein the determining whether the one of the energy-conserving nodes is to respond is based on one or more certain periods in which the one of the energy-conserving nodes is permitted to respond.

16. The method of claim 8, wherein the message comprises times when one or more of the energy-conserving nodes are available to receive data and corresponding channels on which the one or more of the energy-conserving nodes are to receive at the times.

17. An energy-conserving ad hoc network including a plurality of nodes, each of the nodes comprising:

a transceiver configured to receive and transmit data messages;

processing logic;

a memory configured to store a schedule of reception times;

a bellringer transmitter; and

a bellringer receiver, wherein:

when the node is an existing node in the network,

the processing logic is configured to:

receive a wake-up signal via the bellringer receiver, and

responsive to the receiving of the wake-up signal, transmit, via the transceiver, a message including the schedule of reception times,

when the node is a node joining the network,

the processing logic is configured to:

transmit the wake-up signal,

receive the message from an existing one of the nodes in the network, and

join the network based on the message.

18. The energy-conserving ad-hoc network of claim 17, wherein when the node is an existing node, the processing logic of the node is further configured to wait a random time interval before responding to the wake-up signal.

19. The energy-conserving ad hoc network of claim 17, wherein when the node is an existing node, the processing logic further is configured to determine whether to respond to the received wake-up signal based on one of a random decision, a received signal strength of the wake-up signal, a current density of the network from a point of view of the existing node, and one or more certain time periods during which the existing node is configured to respond to the received wake-up signal.

20. A node configured to operate in an energy-conserving ad hoc network, the node comprising:

a transceiver configured to send and receive data messages;

a transmitter configured to transmit a wake-up signal; and

processing logic configured to control operation of the transceiver and the transmitter, wherein

the processing logic is further configured to:

transmit the wake-up signal via the transmitter,

receive a network entry message from one of a plurality of existing nodes in the network, the network entry message including scheduled times in which at least one of the existing nodes in the network is available to receive, and

join the network using the scheduled times.

21. The node of claim 20, wherein the processing logic is further configured to:

turn off the transmitter after transmitting the wake-up signal, and

turn on the transceiver.

22. The node of claim 21, wherein the processing logic is further configured to:

wait for reception of the network entry message after transmitting the wake-up signal, and

when a time limit is exceeded before receiving the network entry message,

turn off the transceiver,

wait a duration of a first time interval,

turn on the transmitter, and

retransmit the wake-up signal.

23. The node of claim 22, wherein the first time interval is a variable interval and the processing logic is further configured to:

increase a length of the first time interval as a number of failed network joining attempts for the node increases.

24. The node of claim 20, further comprising a bellringer receiver, wherein the processing logic is further configured to cause the node to function as an existing network node after joining the network, when functioning as an existing network node, the processing logic is further configured to:

receive, via the bellringer receiver, a wake-up signal transmitted by another node,

wait a random time interval,

power on the transceiver,

transmit the network entry message via the transceiver, and

power off the transceiver.

25. The node of claim 21, wherein when the node functions as an existing node, the processing logic is further configured to:

determine whether to respond to the received wake-up signal based on one of a random decision, a received signal strength of the wake-up signal, a current density of the network from a point of view of the node, and one or more certain time periods during which the node is configured to respond to the received wake-up signal.

26. A machine-readable medium having instructions recorded thereon for at least one processor of a node, when the instructions are executed by the at least one processor, the at least one processor is configured to:

transmit a wake-up signal when the node intends to join a network,

receive a network entry message from an existing node in the network, the message including information regarding availability of at least one network node for receiving a message from the node, and

join the network based on the information included in the network entry message.

27. The machine-readable medium of claim 26, wherein when the instructions are executed by the at least one processor, the at least one processor is further configured to:

turn on a transmitter before the transmitting of the wake-up signal, and

turn off the transmitter after the transmitting of the wake-up signal.

28. The machine-readable medium of claim 26, wherein the at least one processor is further configured to:

when the receiving of the entry message fails to occur during a predetermined time limit:

wait for a duration of a first time interval, and

transmit the wake-up signal.

29. The machine-readable medium of claim 28, wherein the first time interval is a variable time interval and the at least one processor is further configured to:

set the first time interval to a relatively small value, and

increase the value of the first time interval as a number of failed network joining attempts increases.

30. A machine-readable medium having instructions recorded thereon for at least one processor of a node, when the instructions are executed by the at least one processor, the at least one processor is configured to:

receive a wake-up signal via a bellringer receiver, and

responsive to the receiving of the wake-up signal, transmit a network entry message including scheduled times in which one or more of existing network nodes are available to receive.

31. The machine-readable medium of claim 30, wherein the at least one processor is further configured to:

wait a random time interval before transmitting the network entry message.

32. The machine-readable medium of claim 30, wherein the at least one processor is further configured to:

after receiving the wake-up signal, determine whether to respond to the wake-up signal.

33. The machine-readable medium of claim 32, wherein the determining whether to respond is based on one of a random decision, a received signal strength of the wake-up signal, a current density of the network from a point of view of the node, and one or more certain time periods during which the node is configured to respond to the received wake-up signal.

34. A node configured to operate in an energy-conserving ad hoc network, the node comprising:

means for transmitting a wake-up signal;

means for receiving a network entry message from an existing node in the network, the network entry message including sufficient information for the node to join the network; and

means for joining the network using the information.

35. The node of claim 34, wherein the means for receiving comprises:

means for waiting a duration of a first time interval when the network entry message is not received after a predetermined time limit.

36. The node of claim 35, wherein the means for waiting a duration of a first time interval comprises:

means for setting the first time interval, and

means for increasing the first time interval as a number of failed network joining attempts increases for the node.

37. A node in an ad hoc network, comprising:

a memory configured to store one or more time periods during which the node is available to receive; and

a processor configured to:

transmit a first wake-up signal,

receive a message from a neighboring node, the message identifying one or more time periods during which the neighboring node is available to receive,

store the one or more time periods from the message in the memory,

receive a second wake-up signal from a different node, and

transmit a message to the different node, the message including at least the one or more time periods during which the node is available to receive.

38. The node of claim 37, wherein the message transmitted to the different node further includes the one or more time periods during which the neighboring node is available to receive.